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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DIAMOND, ALAN D

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/759,795

Applicant(s)

NEE, HAN

Examiner

Alan Diamond

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10182004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "90" in Figure 2 has been used to designate both a sub-layer and a grid screen. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 1-307278, herein referred to as JP '278.

JP '278 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 95% silver and 5% zinc

(see pages 2 and 3, and, in particular, the paragraph bridging pages 2 and 3). Since JP '278 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

4. Claims 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 60-30183, herein referred to as JP '183.

JP '183 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains silver with the balance being 0.1 to 10 wt% aluminum (see pages 2 and 3). Since JP '183 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

5. Claims 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 59-208789, herein referred to as JP '789.

JP '789 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 95% silver and 5% titanium (see page 2). Since JP '789 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

6. Claims 13, 14, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2002-151720, herein referred to as JP '720. The instant claims are not fully supported by provisional application 60/440,602, and thus, are afforded a filing date of January 16, 2004. JP '720 has a 102(b) publication date of May 24, 2002.

JP '720 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains silver with the balance being 0.03-1 wt% of either aluminum, chromium or titanium (see claim 3 and paragraph

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0047). Since JP '720 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

7. Claims 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Markvart et al, U.S. Patent 4,681,983.

Markvart et al teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 99% silver and 1% titanium (see col. 3, lines 13-22). Since Markvart et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

8. Claims 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Meier et al, U.S. Patent Application Publication 2003/0008485. The instant claims are not fully supported by provisional application 60/440,602, and thus, are afforded a filing date of January 16, 2004. Meier et al has a 102(b) publication date of January 9, 2003.

Meier et al teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains eutectic proportions of silicon and silver, i.e., 96.9% silver with the balance being silicon (see paragraphs 0008-0013). Since Meier et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

9. Claims 5, 6, 17, 18, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 1-310578, herein referred to as JP '578.

JP '578 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer can contain 90% (or more) silver with the balance being either titanium, nickel, chromium, zinc or molybdenum (see the

entire document). Since JP '578 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 1-307278, herein referred to as JP '278, in view of JP 9-162428, herein referred to as JP '428.

JP '278 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 95% silver and 5% zinc (see pages 2 and 3, and, in particular, the paragraph bridging pages 2 and 3). JP '278 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '278 does not specifically require that the surface of the silver-zinc alloy layer is roughened, nor does it specifically teach that the thickness of said silver-zinc alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '278's silver alloy layer with a roughened surface so as to raise the

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conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for JP '278's silver alloy layer so that a functioning solar cell could be prepared.

12. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 60-30183, herein referred to as JP '183, in view of JP 9-162428, herein referred to as JP '428. JP '183 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains silver with the balance being 0.1 to 10 wt% aluminum (see pages 2 and 3). JP '183 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '183 does not specifically require that the surface of the silver-aluminum alloy layer is roughened, nor does it specifically teach that the thickness of said silver-aluminum alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '183's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for JP '183's silver alloy layer so that a functioning solar cell could be prepared.

13. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP

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59-208789, herein referred to as JP '789, in view of JP 9-162428, herein referred to as JP '428. JP '789 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 95% silver and 5% titanium (see page 2). JP '789 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '789 does not specifically require that the surface of the silver-titanium alloy layer is roughened, nor does it specifically teach that the thickness of said silver-titanium alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '789's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for JP '789's silver alloy layer so that a functioning solar cell could be prepared.

14. Claims 13-16 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-151720, herein referred to as JP '720, in view of JP 9-162428, herein referred to as JP '428.

JP '720 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains silver with the balance being 0.03-1 wt% of either aluminum, chromium or titanium (see claim 3 and paragraph

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0047). JP '720 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '720 does not specifically require that the surface of the silver alloy layer is roughened, nor does it specifically teach that the thickness of said silver alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '720's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for JP '720's silver alloy layer so that a functioning solar cell could be prepared.

15. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markvart et al, U.S. Patent 4,681,983, in view of JP 9-162428, herein referred to as JP '428.

Markvart et al teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains 99% silver and 1% titanium (see col. 3, lines 13-22). Markvart et al teaches the limitations of the instant claims other than the difference which is discussed below.

Markvart et al does not specifically require that the surface of the silver-titanium alloy layer is roughened, nor does it specifically teach that the thickness of said silver-

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titanium alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Markvart et al's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for Markvart et al's silver alloy layer so that a functioning solar cell could be prepared.

16. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al, U.S. Patent Application Publication 2003/0008485, in view of JP 9-162428, herein referred to as JP '428.

Meier et al teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer contains eutectic proportions of silicon and silver, i.e., 96.9% silver with the balance being silicon (see paragraphs 0008-0013). Meier et al teaches the limitations of the instant claims other than the difference which is discussed below.

Meier et al does not specifically require that the surface of the silver-silicon alloy layer is roughened, nor does it specifically teach that the thickness of said silver-silicon alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have

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been obvious to one of ordinary skill in the art at the time the invention was made to have provided Meier et al's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for Meier et al's silver alloy layer so that a functioning solar cell could be prepared.

17. Claims 1-3, 17-19, 21-23, 25-27, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-282906, herein referred to as JP '906.

JP '906 teaches an electrode for a solar battery, wherein the electrode is a thin film alloy comprising silicon and 0.3 to 3 at% of copper, gold, platinum or palladium, wherein the thin film has a thickness of 7-25 nm (see paragraphs 0018 to 0030; and claim 4). JP '906 teaches the limitations of the instant claims, other than the difference which is discussed below.

JP '906 does not provide a specific example wherein a solar battery is prepared. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared a solar battery, including a conventional doped semiconductor structure for conversion of light to electricity and JP '906's thin film alloy electrode because such is clearly within the scope of JP '906's disclosure.

18. Claims 4, 20, 24, 28, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '906 as applied to claims 1-3, 17-19, 21-23, 25-27, and 29-31 above, and further in view of JP 9-162428, herein referred to as JP '428. JP '906, as relied upon for the reasons recited above, teaches the limitations of claims 4, 20, 24, 28,

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and 32, the difference being that JP '902 does not specifically require that the surface of the alloy layer is roughened. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '906's alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428.

19. Claims 5-8, 17-20, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 1-310578, herein referred to as JP '578.

JP '578 teaches a solar cell having the claimed doped semiconductor structure and silver-alloy layer, wherein said silver-alloy layer can contain 90% (or more) silver with the balance being either titanium, nickel, chromium, zinc or molybdenum (see the entire document). JP '578 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '578 does not specifically require that the surface of the silver alloy layer is roughened, nor does it specifically teach that the thickness of said silver alloy layer should be 3 to 25 nm. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '578's silver alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428. Furthermore, it would have

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been obvious to one of ordinary skill in the art at the time the invention was made to have determined an appropriate thickness for JP '578's silver alloy layer so that a functioning solar cell could be prepared.

20. Claims 21-23, 25-27, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anazaki et al (U.S. Patent 6,014,196) in view of Li et al (U.S. Patent Application Publication 2003/0081158), Kozaki (U.S. Patent 5,742,367) and Kashima et al (U.S. Patent 4,240,021).

Anazaki et al teaches a transparent electrically conductive film that comprises a silver alloy comprising , for example 99% silver and 1% palladium, or 98% silver and 2% gold, or 98% silver and 2% platinum, wherein the film is used in a display element, such as the liquid crystal display as seen in Anazaki et al's Figure 3 (see also col. 1, lines 6-13; col. 2, line 43 through col. 3, line 17; and the table at col. 10). The silver alloy film has a thickness of 5 to 100 nm (see col. 2, line 62). Anazaki et al teaches the limitations of the instant claims, other than the difference which is discussed below.

Anazaki et al does not specifically teach that its liquid crystal display further comprises a solar cell. However, as shown by Li et al (Figure 1 and paragraphs 0014 and 0015), Kozaki (Figure 1 and col. 2, lines 42-64), and Kashima (Figure 6 and col. 7, lines 10-35), it is conventional in the art to have a solar cell parallel to and beneath a liquid crystal display. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a solar cell beneath Anazaki et al's liquid crystal display because it is conventional to include a solar bell beneath a liquid crystal display, and so that power could be generated by the solar cell.

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21. Claims 24, 28, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anazaki et al in view of Li et al, Kozaki, and Kashima et al as applied to claims 21-23, 25-27, and 29-31 above, and further in view of JP 9-162428, herein referred to as JP '428. Anazaki et al in view of Li et al, Kozaki, and Kashima et al, as relied upon for the reasons recited above, teaches the limitations of claims 24, 28, and 32, the difference being that Anazaki et al does not specifically require that the surface of its silver alloy layer is roughened. JP '428 teaches a roughened electrode for a solar cell that can be made from silver, etc (see entire document). The roughening provides the advantage of raising the conversion efficiency (see paragraph 0002). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Anazaki et al alloy layer with a roughened surface so as to raise the conversion efficiency of the solar cell, as taught by JP '428.

Double Patenting

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 1-32 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6 and 12-16 of copending Application No. 10/431,695. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of said copending application teach that the silver alloy layer can be used in a solar cell (see claim 13 of said copending application)..

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2003/0227250 is hereby made of record.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
February 14, 2006

A handwritten signature in black ink, appearing to read 'Alan Diamond', with a stylized, cursive script.